

Home Based Primary Care: An Economic

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*This is to acknowledge that Namirah Jamshed MD, has disclosed that she does not have any financial interest or other relationships with commercial concerns related directly or indirectly to this program.
Dr. Jamshed will not be discussing off-label uses in her presentation.*

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Dr. Jamshed was a recipient of the three year geriatrics academic career award (GACA 2007-10) from the health resources and services administration (HRSA) in 2007. She was also name the “house call educator of the year” award by the American academy of home care medicine in 2014. Most recently she receives the Practice Change Leadership grant in 2017 from Johns a Hartford Foundation.

Purpose and Overview

The purpose of this session is to understand how home based pliancy care programs can have a positive economic impact on health care spending, while providing high quality of care to the most vulnerable.

Objectives:

1. To know and understand the ageing demographics
2. To know that a small proportion of high risk people are driving majority of health care costs
3. To understand the health policy implications of the rapidly growing older population with multiple chronic conditions and functional impairment
4. To know the data for the independence at home Center of Medicare and Medicaid Services demonstration project and its implications
5. To appreciate the positive impact of Home Based Primary Care on patients and caregiver perspective

Impetus

United States (US) will make history in 2030, when all baby boomers will turn sixty-five. At the same time, they will also outnumber children. (Figure 1 and 2) Nearly 20% of the population in 2030 will be over the age of 65 and the most significant growth will occur in those 85 and older. At the same time, 80% of the older population suffers from at least one chronic condition and 50% suffer from two or more chronic conditions.[1, 2] This tsunami associated with this rapidly changing demographic, will also bring with it an increase in the number of older people with chronic diseases who have significant functional impairment. Many of these people have multiple clinicians taking care of them with lack of communication and coordination of care. Innovative delivery models that enhance care coordination, are therefore, needed to prepare to take care of this vulnerable population. A few years ago home based primary care (HBPC) was not synonymous with financial achievement. However, evidence has shown that taking care of complex frail older people can be both good economics and good patient care. HBPC provides a value based approach for the health care systems, by providing such care to the highest-risk and highest-cost sub-population.

Who are the high-cost high risk?

In 2004 Medicare (MCR) spending exceeded expectations. The Congressional Budget Office (CBO) reported that spending had exceeded 300 billion dollars.[3] Subsequently, in 2005 a paper was prepared to identify these high-risk, high-cost MCR beneficiaries. Additional goal of the report included, exploring approaches to reduce the expected and significant spending growth.

The CBO report showed that spending for health care services was highly concentrated among a small proportion of people with very high service use. The top 5% of beneficiaries were accounting for 43 percent of the MCR expenditure.[3] Amongst the community dwelling people, 20% of all personal health care spending in 2009- or \$275 billion- was on behalf of just 1 percent of the population.[4, 5] These high spenders are mainly older people with multiple chronic conditions (MCC) and functional impairment. Functional disability predicts higher medical costs. [6] In the 2008-2009 Medical Expenditure Panel Survey (MEPS) the elderly represented 12.2% of the overall population, but represented 43% of those individuals who remained in the top decile of spenders. [4] Figure 3. Seniors who have MCC and functional impairment spend more than those without functional impairment. Figure 4[7] They are also more likely to report their health status as only fair or poor. [4] In addition, many of them are at end of life. CBO reported that 14% of the top 5% high-cost MCR beneficiaries, died within a year.[3] In 2014, of the 2.6 million people who died, 80 percent were on MCR, making it the largest insurer of medical care provided at end of life.[8] Many of these people have multiple chronic conditions (MCC), and utilize services such as hospitalization, post-acute care, and hospice in the year leading to death. It is not surprising therefore, that 25% of MCR spending is in the last year of life on beneficiaries 65 or older. However, the higher MCR spending amongst those who died in 2014 was driven disproportionately by inpatient hospital care.[8] Reducing this rate has been a point of intervention for both policy makers and health care systems, to reduce costs and improve quality of care.

A study of MCR claims data from 2003-2004 showed an almost 20% readmission rate within 30 days and 34% within 90 days. Not only that, almost 67% medical and 51.5% surgical patients died within a year of first hospitalization. The authors of this study estimated the cost of unplanned rehospitalization in 2004 to be \$17.4 billion.[9] Hospitals have also been working hard to reduce the inpatient days. However, in this process, patients are spending more time in post-acute care.

This has resulted in an increase in the total home-to-home time.[10, 11] This means that patients are now actually spending more time in post-acute care and discharge home is delayed. Figure 5 shows a study that looked at trends in home-to-home time using MCR administrative claims for 81.6 million hospitalizations in the US between 2004 and 2011.[10] As expected, the average length of hospital stays decreased – from 6.3 days to 5.7 days. However, at the same time the average length of stay at post-acute care facilities across all hospitalizations increased from 4.8 days to 6.0 days, and the total home-to-home time increased from 11.1 days to 11.7 days. Discharging patients to post-acute care facility may help reduce hospital average length of stay, but it is not conclusive that post-acute care improves patient outcomes. In fact, there is mounting concern that it is overused. In 2013, the Institute of Medicine (IOM), commissioned by the Department of Health and Human Services (HHS), published a seminal report, *Variation in Health Care Spending: Target Decision Making, Not Geography*. The report highlighted that the variation in use of MCR Fee-for-Service (FFS) services by states was driven both by acute care services and post-acute services. However, the variation in post-acute services was higher, without an apparent relationship to outcome.[12] IOM committees final recommendation to CMS were to test payment reforms such as value-based purchasing, patient centered medical homes, bundled payments and Accountable Care Organizations, instead of adopting a geographically based value index for MCR which could adversely affect the vulnerable.

Additional insights into the association between health spending and health status comes from a study conducted by the Lewin Group using Medical Expenditure Panel Survey (MEPS) data from 2006.[5] In their study about 30 percent of these high spenders had at least one chronic condition without functional impairment, another 30 percent had chronic conditions with a functional impairment and another 30 percent had chronic condition with significant functional impairment in activities of daily living. More importantly, the number of chronic conditions and functional impairments was associated with higher spending. The most common MCC amongst the high-cost high risk group included hypertension, hyperlipidemia, diabetes, and arthritis. Almost 19 percent of people had presence of significant presence of mental health problems and had a higher prevalence of cardiac conditions. But since these conditions are also present in the low cost population, it is difficult to use just the presence of MCC as a predictor of high spending older people. Therefore, patients who have MCC with functional impairment or functional impairment alone maybe a better indicator to identify the high-risk group.

Functional assessment is the cornerstone of geriatric principles of care. Using nationally representative data from 2009-2011 MEPS, Hayes et al, identified 5% of the US population as “high-need” defined by those with three or more chronic diseases and a functional limitation in personal care or IADL.[13] Functionally impaired people spend three times the average of adults with MCC only. Health care spending is higher at every level for adults with functional impairment when compared to those with MCC alone. These adults are disproportionately older, mostly women and white. They are also less educated, and have low income. Nearly all have health insurance through MCR, Medicaid or a combination, reflecting their age and poor income. From a patient’s perspective combination of MCC and functional impairment leads to worse self-reported health than MCC alone. Not surprisingly, they also utilize health care services at a higher rate, using ED more than twice the rate of those with MCC alone. They are also three times more likely to be hospitalized. Even though they made more doctor visits, it can be challenging if multiple providers are involved. When we examine the total number of adults who incur high health care spending for two years in a row, the study found that nearly all had MCC with or

without functional impairment. As in previous studies, those with MCC and functional limitation represented over a third (37%) of those in the top 10% of health care spending, and almost half (47%) of those in the top 5 percent of spending. [13] Figure 8 Other evidence has confirmed that the top 10 percent of Fee-For-Service (FFS) MCR beneficiaries are mostly dual eligible (30.7% vs 19.8%), have ESRD (11.7% vs 1.1%), and have more hospitalizations (1.9 vs 0.3). Their average Per Member Per Month (PMPM) cost is high compared to the low cost beneficiaries (\$5366 vs \$824). [14] As expected the higher spending was driven by increased utilization of acute inpatient and skilled nursing facility (SNF) use. [14]

One concerning aspect of high-cost, high-risk individuals is that, at least half of remain in the top quartile for at least 2-5 years. Therefore, targeting the highest spenders offers an opportunity to have a significant impact on overall spending. The fact that health care spending is concentrated to a small group of people has important health policy implications. Currently, the high-cost, high-risk older people with MCC and functional impairment are receiving care in a fragmented system in the acute care setting. Lack of coordination between acute care and long term services contributes to avoidable health care utilization. In summary, older people with MCC, functional disability and history of high prior health care utilization, drive about half of the MCR budget.

Changing Focus

It is clear that health care spending is concentrated amongst the few. The 2008” *Retooling for an Aging America*” was focused on developing new models of health care delivery and payment, as old ways sponsored by the federal programs such as Medicare were proving to be ineffective and inefficient.[15] Not only the number of older adults is increasing, the care is also getting more complex. The health care system is moving away from FFS to value based care models, that incentives focus on and improve care for the high risk and high cost older person. The Institute of Healthcare Improvements’ *Triple Aim* provides the basis of one such model:

1. Provide better care for individuals
2. Provide better care for populations
3. Lower per capita cost of health care.

HBPC incorporates the Triple Aim principles, by identifying those with the highest need i.e. Older people with MCC and functional impermanent, by providing continuity of care and reducing avoidable health care utilization.

Home Based Primary Care

HBPC is not a new concept. Its key principles lie in a comprehensive longitudinal primary care model that is delivered to the patient’s home. Its key attributes include the use of interdisciplinary teams (IDT), regular IDT meetings, and after hours’ support. Team may include physicians, advanced practice providers, nurse, and case manager or social workers. HBPC programs focus on providing care to the vulnerable older person with MCC and functional impairment for whom routine, episodic, office-based care is not effective. Core metrics that are typically measured included health care system utilization, quality outcomes, cost shift and patient/caregiver satisfaction.

Veteran’s Affairs Home Based Primary Care

The Veterans Affairs (VA) has been dealing with the challenge

s of a “burgeoning” older population earlier than the rest of the nation. One way the VA decided to combat this by leading the experience with HBPC, which marked the beginning of an era of success. In 1972 the VA implemented the HBPC model of care to provide care to its most vulnerable veterans at six sites.[14] The goal was to avoid unnecessary hospitalization and long term care placement. The strategy was simple, shift care from acute care institution to home by providing care to the patient in their home.

In 2002 the VA conducted a national analysis of its HBPC programs. It was a pre and post enrollment analysis of six months. Results for the 11,334 veterans showed a reduction of 62% for hospital bed days, 88% reduction in nursing home bed days, and an increase in home care by 264%. The mean VA cost also dropped by 24%, from \$38000 to \$29000 per patient per year. Based on this positive report the VA implemented quality measures for the HBPC program, to continually assess its benefits for reducing health care utilization. These results were confirmed again in 2007 with a higher reduction in acute inpatient and nursing home utilization (59% and 89%). It was also concomitant with a 21% reduction in 30-day readmission rate. [16] A CBO report in 2007 identified the following key attributes of the VA HBPC program as the probable reason for success: 1. Electronic health record; 2. Quality and performance measures as drivers of the system; and 3. Program focused on chronic disabling disease. [16]

To determine the impact of VA HBPC a study was conducted on access, quality and cost. The authors used the CMS validated risk adjustment model (HCC) to determine the effect of HBPC on VA +MCR costs and to distinguish cost shifting, concurrent analysis of VA and MCR costs and usage for fiscal year (FY) 2006 (10/1/05-09/30/16). They compared the total cost of HBPC with projected cost for the same population. Additionally, they examined the patient and family perspective through qualitative data. The 9,425 veterans enrolled in the HBPC program were predominantly male (96%), with majority (69%) having dependence in two or more activities of daily living. Participants on average had more than 8 medical and mental health conditions with a median survival of 38 months, 1-year survival of 76%, and a 5-year survival of 33%. For the veterans in the HBPC program, who were enrolled both in the VA and the Medicare system, HBPC enrollment was associated with a 13.4% reduction annually, in total combined VA + MC costs, 16.7% reduction VA costs, and 10.8% reduction in Medicare costs. The cost reductions were primarily due to a 25.5% reduction in admission and 36.5% reduction in hospital days. This contributed to a net cost reduction of \$6,184 per patient per year. They also saw a larger magnitude and proportion of cost reduction in the higher risk scores. The observed annualized cost during HBPC was 11.7% lower than projected cost. Figure 6. From a patient’s perspective that were reported by 31 patient and caregivers the positive themes included those around enhanced interaction with staff, increased access to care, and greater focus on education and outreach. At the same time, VA HBPC program was voted the highest overall satisfaction amongst all VA programs. [17] In summary, as with their previous data, the VA HBPC program not only reduced the total cost of care to the VA and Medicare but also provided greater patient and caregiver satisfaction.

Community Dwelling Fee-For-Service Home Based Primary Care

To study the impact of HBPC on community dwelling older people, Dr. Dejonge and colleagues did a case-control concurrent study using Medicare administrative data.[18] They studied 722 HBPC participants and matched them to a control group of 2,161 for sex, age bands, race, Medicare buy in status, long term nursing home status, cognitive impairment and frailty. Mean age for both groups was 82-84 years and both groups were predominantly female (77%) and African American (90%). In their study the average cost of care prior to HBPC enrollment was not statistically different. They followed the patient for a mean of 2 years. In their univariate analysis they found that HBPC enrolled patients had lower total Medicare costs, hospital costs and SNF costs, with a higher cost for home health and hospice. In the multivariate model, cases had a 17% reduction in Medicare costs, averaging \$8477 less per beneficiary over 2 years of follow up. There was no significant difference in mortality for the two groups 40% vs 36% or the average time to death, 16.2 months' vs 16.8 months. Figure 7

Implications

Despite promising data, adaptation of the HBPC model of care for the high-risk, high-cost patients by health care systems, and providers has been slow and challenging. Much of this has to do with poor Medicare reimbursement. MCR does not cover payment for travel, coordination care with family and caregivers. Since HBPC programs are cost saving and not cost generating MCR lacks system to attribute this's savings. This lack of a viable payment model has made it difficult for providers to adapt successful innovative models.

An opportunity has struck however with the affordable care act. Accountable care organizations are incentivized to keep people well and reduce unnecessary health care utilization which would result in cost sharing of the savings. New payment structures provide opportunities to health care system to consider value. HBPC programs finally found an opportunity to share their cost savings experience at a larger scale. Under section 3024 of the Patient Protection and the Affordable Care Act (PL 111-148), the US congress mandated the Centers of Medicare and Medicaid Services (CMS) to conduct a demonstration designed to test the ability of the HBPC model to reduce health care costs and improve health care outcomes of high-need Medicare Beneficiaries. As a response to this mandate, the Centers for Medicare and Medicaid Innovation launched the independence at home project.

Independence at Home

In the last twenty years, many innovative chronic care models have emerged that focus on older adults with MCC and functional disability. These include Social Health maintenance organizations (S/HMO), PACE, Medicare Care Coordination (MCC) Demo, Special Needs Program (SNP), Chronic Care Model (CCM), Medicare Health Support (MHS), Disease Management (DM), and most recently, the Advanced Medical Home (AMH). Unfortunately, despite efforts most had limited success. Most recently, under the Affordable Care Act, a new model called, Independence at Home (IAH) was proposed to focus on care of the vulnerable elders, based on experience of hundreds of HBPC programs in the country. The IAH Act, was introduced in the United States Senate and House in September 2008 (H.R. 7114 and S. 3613).[19]

IAH program is based on the CBO findings from 2005, that highlighted the small concentration of MCR beneficiaries were driving majority of the cost. It uses a shared savings payment model, rather than risk-based financing. The criteria for enrollment is less stringent than the previous

PACE program. IAH practices are accountable for a minimum 5% annual savings before any extra payments can be made from shared savings.

In 2012 eighteen practices were chosen to participate in the Independence at Home (IAH) demonstration project for three years. IAH was implemented for older MCR beneficiaries with MCC and functional impairment. The practices were required to design and implement coordinated care plans tailored to “improve the provision of comprehensive, coordinated, continuous, and accessible care to chronically ill, disabled beneficiaries.”

IAH targets the high-cost, high-risk MCR beneficiaries with functional impairment, using the HBPC delivery model of care. It requires accountability of care across all setting, and aligns quality metrics and payment incentives. The eligibility criteria include beneficiaries to have 2 or more chronic conditions, assistance in 2 or more basic ADLS, and one non-elective hospitalization or acute/subacute rehabilitation within 12 months of enrollment. These are called the IAH Qualifying (IAH-Q) criteria. Quality metrics include documentation of patient preferences, improving transitions of care, in home medication reconciliation within 48 hours of discharge, lowering of 30-day readmission rate, reduction of ambulatory care sensitive hospitalization and ED visits.

IAH demonstration project has been one of CMS most successful chronic care management demonstrations. After two years of the project, IAH practices saved, in aggregate, a net of \$7,821,374 dollars. Seven participating practices received incentive payments in the amount of 5,322,343 million dollars. The first two-year result included quality improvement findings in reduction of 30-day readmission rate, follow up contact by a clinician within 48 hours of discharge from hospital, Emergency Department (ED) or Skilled Nursing Facility (SNF), medication reconciliation within 48 hours of discharge, documentation of patient preferences and reduction in ED and hospital utilization for chronic diseases. On average the IAH demonstration project has saved an average of \$2700 per beneficiary per year (PBPY) in the first two years. Based on these successes the IAH program has been extended for another two years in February 2018 under the containing resolution to fund the federal government. The cap of beneficiaries was also increased from 10,000 to 15,000. Accountable care organizations came into being with the goal of similar savings. Data shows that IAH in its initial year saved 10 times as much as pioneer ACO on a per beneficiary per month basis (\$360 vs \$36). The updated release of the IAH results increases this difference to 12 times as much as ACOs. The shared savings model incentivizes practices by allowing the first 5% of the savings to go to CMS and up to 80% to be earned by the practices of the savings thereafter. To qualify for these savings, the practice has to have 5% annual savings as a minimal threshold and meet at least three of the six quality metrics, with graduated access to earned savings share with higher quality scores.

Dr Kinosian et al projected expected savings was IAH allowed to expand nationwide over 10 years as a MCR program or with limited expansion in a 2-year demonstration extension beyond October 1, 2017. [20] Previously they had projected the national IAH-Q population from the 2012 CMS 5% file.[21] In the new calculations they applied the IAH-Q criteria to the 2012-2014 5% files and then expanded them to the full MCR population. [21] In 2014 2.35 million MCR enrollees met the IAH-Q criteria. Based on a 20% annual growth rate, IAH would penetrate 17% of the total IAH-Q population by 10 years or 400,888 beneficiaries’ vs current 15,000. Projected totals savings would be 7.6 billion dollars. They estimated that \$1.05 billion is from avoiding Long term care institutionalization. Shared savings would be \$2.4 billion over 10 years, for a net CMS savings of 5.2 billion. If annual growth was fixed at 20,000, then by year 10 the IAH-Q penetration would be

10% with lower projected savings.[20] As penetration increases so does savings, with net loss to CMS depending on increased cap size. There are limitations to these projections, since it is based on a two-year data. Also the LTI savings are based on data from one site only. However, the trend in the demonstration project seem to support the assumption of continued savings. Expanding IAH to the frail elderly has the potential to produce substantial savings for CMS and health care systems, while providing high quality care.

Patients perspective

Our current health care system is fragmented and provides uncoordinated health care. Multiple parties are responsible for services, and health care systems work in parallel. The separate funding system, and conflicting regulations work against those who need it the most. Less than 12 percent of homebound people report that they receive any primary care services at home. There is preliminary evidence that HBPC improves quality of care as well as patient and family member satisfaction. Patient receiving care at home also tend to receive less aggressive care at end of life and more often die at home. This is the preference of the vast majority of Americans. In the VA study patients and caregivers reported significant benefits to the care through HBPC program vs the traditional. Patient felt the care at home was more personalized and had peace of mind.

COVE (Care of the Vulnerable Elderly) HBPC program at UT Southwestern Medical Center, Dallas, TX

Our small program is embedded within the Division of Geriatrics. The eligibility criteria are simple:

65 and older

At least one chronic care condition or dementia

At least one impairment in BADL

Within 10 miles of the south campus

Once a patient is enrolled, our EPIC registry can filter patients who have IAH-Q criteria. The team includes physicians, NP, social worker, clinical coordinator and a nurse. New patients are seen by the physician and then follow up with NP is based on a MD:NP 1:2 ratios. Most all urgent visits, and discharge follow ups are done by the NP. Based on the most recent data, the program is expected to grow by 42% by FY 2018.

Demographics

Mean age of our patients who are also participating with our ACO is 88, with 70% female and 30% male. When evaluating the data for our ACO patients, if data is annualized to 1000 patients, COVE has the potential to reduce ED visits by almost 35.2%, admissions by 35.1%, readmissions nearly 60%, SNF utilization spending by 48.6%, and specialist visits by 46.2%. As with all other HBPC programs our HH spending and hospice spend is high at 18.9% and 55.1% respectively without change in mortality.

Conclusions:

HBPC offers a promising path to optimize care for the sickest and frailest of our nation: the older adults with MCC and functional impairment. The US population age 85 and older is expected to

quadruple by 2050. The robust cost savings are clear based on the success of HBPC programs both at the VA and in the community. The IAH demonstration project confirms their findings and cost savings. From a patient’s perspective HBPC gives peace of mind and the change to stay home to avoid unnecessary ED and hospital visits. Management of people with chronic diseases and functional impairment cannot be episodic. It needs to be comprehensive, longitudinal and interdisciplinary. Extending HBPC to older people who would benefit the most, could help reduce federal government spending, and improve patient and caregiver satisfaction. Payment models that attract broader participation will be key to the success of HBPC programs. As the nation moves towards value-based system, HBPC is a viable option for the sickest and the costliest. It is time therefore that we invest in this model of care at a health care system level.

Figure 1

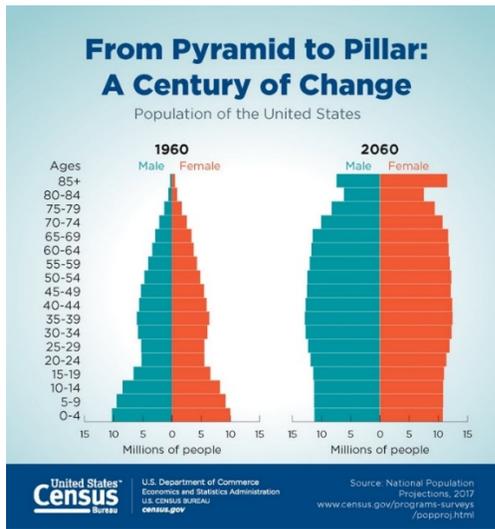


Figure 2

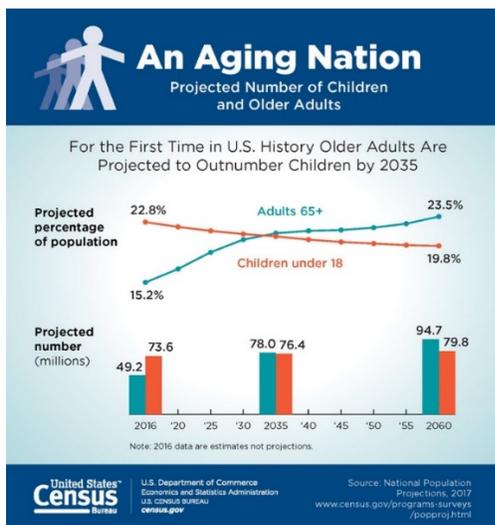


Figure 3

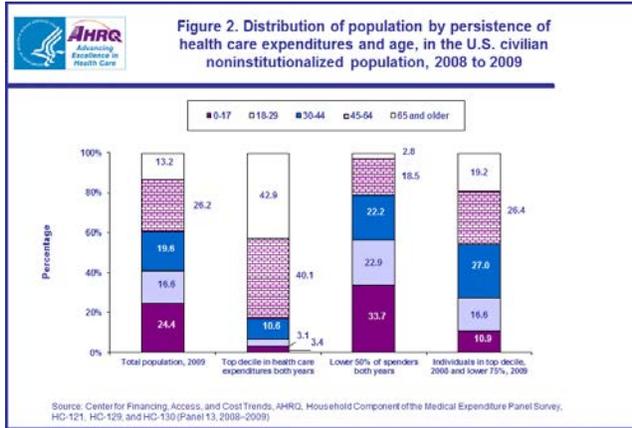


Figure 4

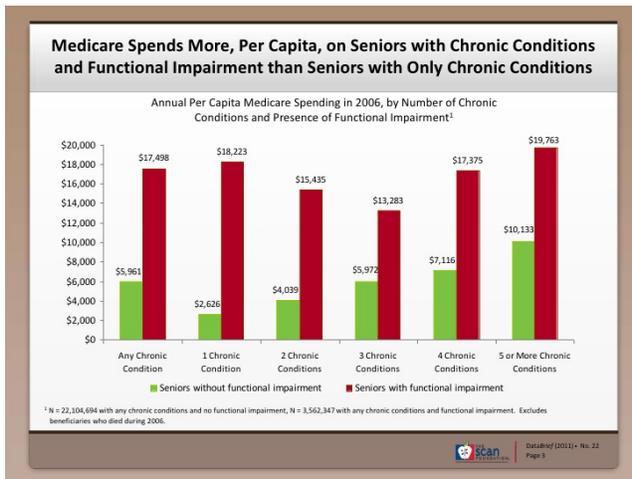


Figure 5

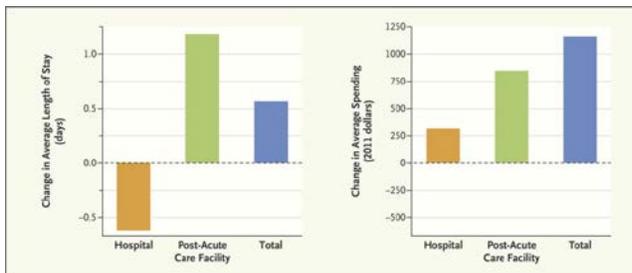


Figure 6

> Average Observed, Predicted & Post Enrollment Annualized Costs by Risk Adjustment Decile:
 HBPC (942 participants per decile); n = 9,425 for total
 > Annualization Adjusted for 1-yr Mortality of 24%
 > Mean Observed \$45,980 +/- \$34,383 ; Mean Predicted \$45,948 +/- 3,692

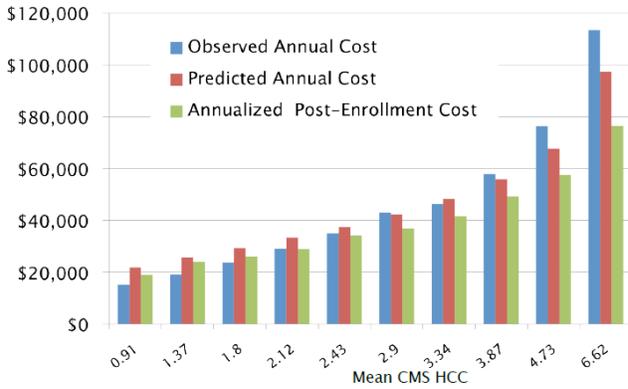


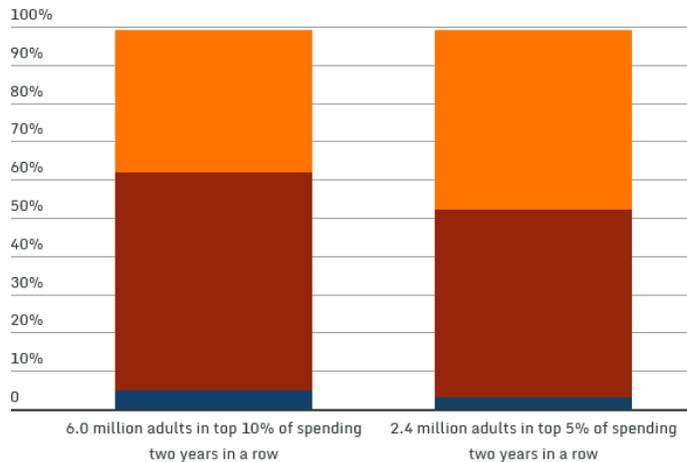
Figure 7

Outcome Variable	Cases, n = 722	Controls, n = 2,161	P-Value
Medicare-eligible months (95% CI)	23.3 (22.1-24.5)	24.2 (23.6-24.9)	.18
Medicare cost categories, \$ (95% CI)			
Hospice	3,144 (2,287-4,001)	1,805 (1,178-1,833)	<.001
Home health	6,579 (5,323-7,236)	4,170 (3,827-4,512)	<.001
Physician	4,143 (3,691-4,596)	5,718 (5,416-6,019)	<.001
Skilled nursing facility	4,821 (4,070-5,571)	6,098 (5,570-6,626)	.006
Other*	7,962 (6,723-9,202)	11,392 (10,265-12,519)	<.001
Hospitalization	17,805 (15,438-20,173)	22,096 (20,533-23,659)	.003
Total Medicare costs	44,455 (40,376-48,533)	50,978 (48,059-53,896)	.01

The follow-up period began in the month after the index month and extended until the month of death, last month of fee-for-service eligibility, or end of the study period in December 2008.
 CI = confidence interval.

* Including diagnostic testing, transportation, Medicare Part B drugs, nonphysician practitioners, durable medical equipment, and outpatient facility use.

Figure 9



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